REMARKS

The rejections of Claims 38-40, 42-46, 50, 56, 77, 78, 98 and 105 under 35 U.S.C. §102(b) as clearly anticipated by U.S. 5,615,626 (Floyd et al), and of Claims 100-104 and 106 under 35 U.S.C. §103(a) as unpatentable over Floyd et al in view of U.S. 3,260,587 (Dolf et al), are respectfully traversed.

As recited in active Claim 38, the present invention is a process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

The choice made according to Claim 38 is very advantageous for the whole glass industry. It makes it possible to feed the melting furnace with at least partly organic materials and glass/organic composite materials that were hard to recycle (like windshields or mineral wool with organic binder). This is possible only because the burners are submerged ones. Only those particular burners make it possible to bring the combustibles at their vicinity, below the bath of molten glass. Furthermore, as explained in the specification, the submerged burners generate a lot of convection movements within the bath of molten glass, which makes the permanent renewal of the combustible elements at their vicinity possible. This is very innovating and could not have been imagined with conventional melting furnaces (either those using immersed electrodes and called electrical furnaces or those using burners above the bath of molten glass and sometimes called gas furnaces). This is a

completely new use of the technology of the submerged burners (recycling/valorization of composite/waste materials), which renders it more attractive.

The subject matter of Claim 57 is also patentable for the same reasons.

Floyd et al disclose a process for disposal of waste materials, including municipal waste such as garbage, industrial wastes, waste materials including rubber and plastics-based materials, and ash waste from municipal waste incinerators and toxic waste incinerators, wherein the waste is charged to a reactor of a top-submerged lancing injector reactor system, containing a molten slag bath maintained in a turbulent condition during charging of the waste by top-submerged injection therein of a free-oxygen containing gas, using at least one top-submerged lance of the system. The waste is taken into the molten bath and is caused to circulate therein to a combustion/oxidation zone generated by the top-submerged injection. Constituents of the waste are subjected to free-oxygen of the injected gas in that zone and to heat energy of the slag, and thereby combusted/oxidized and/or decomposed. See the Abstract thereof. In addition, Floyd et al disclose that while the waste is being combusted in the reactor, the slag may be maintained at a temperature of from about 1100°C to 1800°C (column 3, lines 34-36 and column 6, lines 3-10). Floyd et al disclose further that rather than simply producing an ash residue as in existing processes, the process of their invention forms a slag product which, being a glassy phase, essentially encapsulates any ash produced and retains in solid solution any heavy metals which are not able to form a fume (column 7, lines 44-48). As disclosed at column 10, lines 45-48, Floyd et al is concerned with substantially complete combustion/oxidation of waste charged to their reactor.

Floyd et al neither disclose nor suggest the presently-claimed invention. The slag of Floyd et al acts, in essence, as a vehicle for the substantially completely combusted/oxidized waste therein. In the presently-claimed invention, while some combustion necessarily may

occur due to the presence of combustible elements, nevertheless, the most-desired components of the vitrifiable materials, such as glass, are melted, not combusted. Floyd et al's apparatus is essentially an incinerator, not a melting chamber. One of Applicants' main goals herein is the ability to recycle vitrifiable materials such as glazings. Clearly, such recycle could not be achieved with the process of Floyd et al.

The Examiner finds that Floyd et al's municipal waste would include various "glazings." In reply, municipal waste would include just about anything, but since glass materials are not even listed in Floyd et al, Floyd et al contemplates relatively small amounts thereof at best. One skilled in the art would not look to Floyd et al to solve a problem regarding recovering vitrifiable materials, such as glazings.

Dolf et al is relied on for a disclosure of submerged combustion methods and apparatus. Particularly, the Examiner relies on the disclosure in Dolf et al of a glass melting furnace with submerged gas burners, as a reason for why one skilled in the art would use the process of Floyd et al to produce a glass product. Dolf et al does not remedy the above-discussed deficiencies in Floyd et al.

In reply, it is not clear why one skilled in the art would combine Floyd et al and Dolf et al. As discussed above, Floyd et al require that their waste be at least substantially completely combusted/oxidized. Melting the vitrifiable waste in Floyd et al without substantially completely combusting/oxidizing it, would frustrate Floyd et al's goals. In addition, the result would be Floyd et al's molten slag with molten vitrifiable materials of the waste. It is not clear that this product would have any value in producing recycled vitrifiable waste therefrom. Indeed, the final slag has a very small volume compared to the total mass of waste treated (column 8, lines 42-44). Figure 1 of Floyd et al shows that the treated mass is very porous and that gases easily circulate throughout the treated mass; the slag contains

encapsulated ash and its state is not well-defined. Clearly, one skilled in the art interested in manufacturing glass would not carry out Floyd et al as any of the steps.

For all of the above reasons, it is respectfully requested that these rejections be withdrawn.

Applicants note the Examiner's lining out of the reference designated as "AW" on the Form PTO-1449 submitted with the IDS filed May 23, 2002. **Submitted herewith** is another IDS with an English translation of the same reference, and a new Form PTO-1449. The Examiner is respectfully requested to initial the new Form PTO 1449, and include a copy thereof with the next Office communication.

All of the presently pending and active claims in this application are now believed to be immediate condition for allowance. The Examiner is respectfully requested to withdraw

the restriction requirement, and in the absence of additional grounds of rejection, pass this application to issue with all pending claims.

Respectfully submitted,

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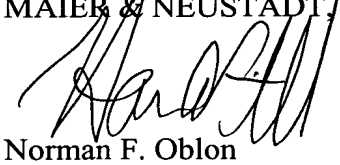

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IN THE CLAIMS

--38. (Twice amended) Process of manufacturing glass from vitrifiable materials comprising a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

57. (Twice amended) Apparatus adapted for carrying out a step in manufacturing glass from vitrifiable materials comprising:

at least one melting chamber equipped with burners which are fed with at least one natural gas fossil fuel and with an air or oxygen oxidizer, the said burners being placed so as to inject said fuel and oxidizer, or gases resulting from combustion of said fuel and oxidizer, below the level of the mass of vitrifiable materials introduced into said melting chamber; said vitrifiable materials comprising liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof.

59. (Amended) Apparatus adapted for carrying out a step in manufacturing glass from vitrifiable materials comprising:

at least one melting chamber equipped with burners which are fed with at least one natural gas fossil fuel and with an air or oxygen oxidizer, the said burners being placed so as to inject the said fuel and oxidizer, or gases resulting from combustion of said fuel and oxidizer, below the level of the mass of vitrifiable materials introduced into said melting chamber; and

means for refining the molten vitrifiable materials in the form of a thin layer, in the melting chamber or in at least one refining compartment downstream of said chamber.

73. (Amended) Apparatus adapted for carrying out a step in manufacturing glass from vitrifiable materials comprising a melting chamber with walls made of a material comprising refractory materials, said chamber being associated with a cooling system using a water-based fluid, and wherein the walls are lined with a lining of a molybdenum-based metal.

100. (Amended) [A] The process [of manufacturing glass comprising performing the process of] according to claim 38, [during said manufacturing] comprising additional steps, whereby said glass is manufactured.

105. (Amended) A process of recycling metal/glass or plastic/glass composite materials comprising [performing the process of claim 38] a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said recycling.

106. (Amended) A process of manufacturing an electronic part comprising [performing the process of claim 38] a step of supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, and mixtures thereof, during said manufacturing.

107. (Amended) An apparatus for manufacturing glass comprising [employing] the apparatus of claim 57 [during said manufacturing].

108. (Amended) The apparatus according to claim [100] 107, wherein the glass is flat glass.

109. (Amended) The apparatus according to claim [101] 108, wherein the flat glass has a residual blue color and a solar-protection or fire-resistance function.

110. (Amended) The apparatus according to claim [100] 107, wherein the glass is in the form of a bottle or a flask.

111. (Amended) The apparatus according to claim [100] 107, wherein the glass is glass wool or glass fiber.

114. (Amended) Apparatus adapted for carrying out a step in manufacturing glass from vitrifiable materials [for melting vitrifiable materials] comprising:

at least one melting chamber equipped with burners which are fed with at least one natural gas fossil fuel and with an air or oxygen oxidizer, the said burners being placed so as to inject said fuel and oxidizer, or gases resulting from combustion of said fuel and oxidizer, below the level of the mass of vitrifiable materials introduced into said melting chamber; and

means for refining the molten vitrifiable materials in the form of a thin layer, in the melting chamber or in at least one refining compartment downstream of said chamber.

115. (New)

116. (New)--

109. (Amended) The apparatus according to claim 108, wherein the flat glass has a residual blue color and a solar-protection or fire-resistance function.

110. (Amended) The apparatus according to claim 107, wherein the glass is in the form of a bottle or a flask.

111. (Amended) The apparatus according to claim 107, wherein the glass is glass wool or glass fiber.

114. (Amended) Apparatus adapted for carrying out a step in manufacturing glass from vitrifiable materials [for melting vitrifiable materials] comprising:

at least one melting chamber equipped with burners which are fed with at least one natural gas fossil fuel and with an air or oxygen oxidizer, the said burners being placed so as to inject said fuel and oxidizer, or gases resulting from combustion of said fuel and oxidizer, below the level of the mass of vitrifiable materials introduced into said melting chamber; and

means for refining the molten vitrifiable materials in the form of a thin layer, in the melting chamber or in at least one refining compartment downstream of said chamber.

Please add the following new Claims 115-116:

115. (New) Process according to claim 38, wherein the vitrifiable material is melted into a foamy glass.

116. (New) Process according to claim 115, wherein the foamy glass has a density of approximately 0.5 to 2 g/cm^3.